

ARIZONA ALIGNMENT FOR NIH SUPPLEMENT DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY

DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY		
Arizona Science Academic Standards: Grades 6, 7, 8		
Lesson	Standard	Performance Objective
1	SC06-S1C1-01	Differentiate among a question, hypothesis, and prediction.
All lessons	SC06-S1C1-02 SC07-S1C1-01 SC08-S1C1-01	Formulate questions based on observations that lead to the development of a hypothesis.
All lessons	SC07-S1C1-02 SC08-S1C1-02	Select appropriate resources for background information related to a question, for use in the design of a controlled investigation. (7) Use appropriate research information, not limited to a single source, to use in the development of a testable hypothesis. (8)
All lessons	SC07-S1C1-03 SC08-S1C1-03	Explain the role of a hypothesis in a scientific inquiry. (7) Generate a hypothesis that can be tested. (8)
1, 3, 4	SC06-S1C2-01 SC07-S1C2-01 SC08-S1C2-01	Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.
All lessons	SC06-S1C2-02 SC07-S1C2-02 SC07-S1C2-02	Design an investigation to test individual variables using scientific processes. (6 & 7) Design a controlled investigation to support or reject a hypothesis. (8)
All lessons	SC06-S1C2-03 SC07-S1C2-03 SC08-S1C2-03	Conduct a controlled investigation using scientific processes. (6) Conduct a controlled investigation, utilizing multiple trials, to test a hypothesis using scientific processes. (7) Conduct a controlled investigation to support or reject a hypothesis. (8)
1	SC06-S1C2-04 SC07-S1C2-04 SC08-S1C2-04	Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).
1, 3, 4	SC06-S1C2-05 SC07-S1C2-05 SC08-S1C2-05	Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.
1, 3, 4	SC06-S1C3-01 SC07-S1C3-01 SC07-S1C3-01	Analyze data obtained in a scientific investigation to identify trends.
1, 3, 4	SC06-S1C3-02 SC07-S1C3-02 SC08-S1C3-02	Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).
All lessons	SC06-S1C3-03	Evaluate the observations and data reported by others. (6) Analyze results of data collection in order to accept or

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	SC07-S1C3-03	reject the hypothesis. (7)
3, 4	SC08-S1C3-03	Interpret data that show a variety of possible relationships between two variables, including: positive relationship, negative relationship, or no relationship.
3, 4	SC06-S1C3-04	Interpret simple tables and graphs produced by others.
1, 3, 4	SC07-S1C3-04 SC08-S1C3-05	Determine the validity and reliability of results of an investigation. (7) Explain how evidence supports the validity and reliability of a conclusion. (8)
3, 4	SC08-S1C3-04	Formulate a future investigation based on the data collected.
3, 4	SC06-S1C3-05	Analyze the results from previous and/or similar investigations to verify the results of the current investigation.
1, 3, 4	SC07-S1C3-05	Formulate a conclusion based on results from investigations.
1, 3, 4	SC07-S1C3-06	Refine hypotheses based on results from investigations.
1, 3	SC08-S1C3-06	Identify the potential investigational error that may occur (e.g., flawed investigational design, inaccurate measurement, computational errors, unethical reporting).
1, 3, 4	SC06-S1C3-06 SC07-S1C3-07 SC08-S1C3-08	Formulate new questions based on the results of a completed (6) or previous (7 & 8) investigation.
3	SC06-S1C4-01 SC07-S1C4-01 SC08-S1C4-02	Choose an appropriate graphic representation for collected data: line graph, double bar graph, stem and leaf plot, or histogram.
3	SC06-S1C4-02 SC07-S1C4-02	Display data collected from a controlled investigation.
1, 3, 4	SC06-S1C4-03 SC07-S1C4-03 SC08-S1C4-01	Communicate the results of an investigation (8) with appropriate use of qualitative and quantitative information. (6 & 7)
All lessons	SC08-S1C4-03	Present analyses and conclusions in clear, concise formats.
2, 3, 4	SC06-S1C4-04 SC07-S1C4-04 SC08-S1C4-04	Create a list of instructions that others can follow in carrying out a procedure (6) / Write clear, step-by-step instructions for following procedures (7), conducting investigations or operating equipment (8) (without the use of personal pronouns).
1, 3, 4	SC06-S1C4-05 SC07-S1C4-05 SC08-S1C4-05	Communicate the results and conclusion of the investigation.
1, 3, 4	SC06-S2C2-01 SC07-S2C2-01	Describe how science is an ongoing process that changes in response to new information and discoveries.
3, 4	SC06-S2C2-02 SC07-S2C2-02 SC08-S2C2-02	Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.
All lessons	SC06-S2C2-03	Apply the following scientific processes to other problem solving or decision making situations: observing,

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	SC07-S2C2-03 SC08-S2C2-01	questioning, communicating, comparing, measuring, classifying, predicting, organizing data, inferring, generating hypotheses, and identifying variables.
2	SC08-S2C2-04	Explain why scientific claims may be questionable if based on very small samples of data, biased samples, or samples for which there was no control.
	SC07-S3C1-01 SC08-S3C1-01	Analyze environmental risks (e.g., pollution, destruction of habitat) caused by human interaction with biological or geological systems. (7) Analyze the risk factors associated with natural, human induced, and/or biological hazards, including: waste disposal of industrial chemicals. (8)
2, 3, 4	SC06-S3C2-01 SC07-S3C2-01 SC08-S3C2-01	Propose viable methods of responding to an identified need or problem.
3, 4	SC06-S3C2-02 SC07-S3C2-02 SC08-S3C2-02	Compare possible solutions to best address an identified need or problem.

Arizona Mathematics Academic Standards: Grades 6, 7, 8

Lesson	Standard	Performance Objective
3, 4	M06-S1C2-01 M07-S1C2-03 M08-S1C2-01	Select the grade-level appropriate operation to solve word problems.
3, 4	M06-S1C2-02 M07-S1C2-04 M08-S1C2-02	Solve word problems using grade-level appropriate operations and numbers.
3, 4	M06-S1C2-03 M07-S1C2-07 M08-S1C2-06	Apply grade-level appropriate properties to assist in computation.
3, 4	M06-S1C2-05 M07-S1C2-09 M08-S1C2-08	Use grade-level appropriate mathematical terminology.
3, 4	M07-S1C2-01	Add integers.
3, 4	M07-S1C2-05	Multiply integers.
3, 4	M07-S1C2-06	Divide integers.
3, 4	M07-S1C2-10	Calculate the percent of a given number.
All lessons	M06-S2C1-01 M07-S2C1-01 M08-S2C1-01	Formulate questions to collect data in contextual situations.

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3	M06-S2C1-03 M07-S2C1-04	Interpret simple displays of data including double bar graphs, tally charts, frequency tables, circle graphs, and line graphs (6) / including histograms, stem-and-leaf plots, circle graphs, and double line graphs. (7)
3	M06-S2C1-04 M07-S2C1-05	Answer questions based on: simple displays of data including double bar graphs, tally charts, frequency tables, circle graphs, and line graphs (6); data displays including histograms, stem-and-leaf plots, circle graphs, and double line graphs. (7)
3, 4	M06-S2C1-06 M07-S2C1-07	Identify a trend (variable increasing, decreasing, remaining constant) from displayed data. (6) Interpret trends from displayed data. (7)
3, 4	M08-S2C1-07	Formulate reasonable predictions based on a given set of data.
3, 4	M06-S2C1-07 M07-S2C1-08 M08-S2C1-08	Compare trends in data related to the same investigation.
3	M06-S2C1-08 M07-S2C1-09	Solve contextual problems using: bar graphs, tally charts, and frequency tables (6); histograms, line graphs of continuous data, double bar graphs, and stem-and-leaf plots. (7)
3, 4	M08-S2C1-12	Distinguish between causation and correlation.
2, 3, 4	M08-S2C2-06	Distinguish between independent and dependent events.
4	M08-S3C3-08	Solve one-step equations that model contextual situations.
1	M06-S4C4-01	Determine the appropriate measure of accuracy within a system for a given contextual situation.
1	M07-S4C4-02	Measure to the appropriate degree of accuracy.
1	M06-S4C4-03	Determine a linear measurement to the appropriate degree of accuracy.

Arizona Language Arts Academic Standards: Grades 6, 7, 8

Reading

Lesson	Standard	Performance Objective
2, 3, 4	R06-S1C4-02 R07-S1C4-02 R08-S1C4-02	Use context to identify the meaning of unfamiliar words (e.g., definition, example, restatement, synonym, contrast).
2, 3, 4	R06-S1C6-03 R07-S1C6-03 R08-S1C6-03	Generate clarifying questions in order to comprehend text.
2, 3, 4	R06-S1C6-05 R07-S1C6-05 R08-S1C6-05	Connect information and events in text to experience and to related text and sources.

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3, 4	R06-S1C6-07 R07-S1C6-07 R08-S1C6-07	Use reading strategies (e.g., drawing conclusions, determining cause and effect, making inferences, sequencing) to comprehend text.
3, 4	R06-S3C1-01 R07-S3C1-01 R08-S3C1-01	Restate the main idea (explicit or implicit) and supporting details in expository text.
3, 4	R06-S3C1-02 R07-S3C1-02 R08-S3C1-02	Summarize the main idea (stated or implied) and critical details of expository text, maintaining chronological, sequential, or logical order.
2, 3, 4	R06-S3C1-03 R07-S3C1-03 R08-S3C1-03	Distinguish fact from opinion in expository text, proving supporting evidence from text.
3, 4	R06-S3C1-07 R07-S3C1-08 R08-S3C1-08	Interpret graphic features (e.g., charts, maps, diagrams, illustrations, tables, timelines, graphs) of expository text.
3, 4	R06-S3C1-09	Draw valid conclusions about expository text, supported by text evidence.
3, 4	R07-S3C1-10 R08-S3C1-10	Make relevant inferences about expository text, supported by text evidence.
2, 3, 4	R06-S3C2-01 R07-S3C2-01 R08-S3C2-01	Use information from text and text features to determine the sequence of activities needed to carry out a procedure.
All lessons	R06-S3C2-03 R07-S3C2-03 R08-S3C2-03	Interpret details from functional text for a specific purpose (e.g., to follow directions, to solve a problems, to perform a procedure, to answer questions. (6) Interpret details from a variety of functional text (e.g., warranties, product information, technical manuals, instructional manuals, consumer safety publications) for a specific purpose (e.g., to follow directions, to solve problems, to perform procedures, to answer questions). (7 & 8)
Writing		
Lesson	Standard	Performance Objective
All lessons	W06-S1C1-02 W07-S1C1-02 W08-S1C1-02	Determine the purpose (e.g., to entertain, to inform, to communicate, to persuade, to explain) of an intended writing piece.
All lessons	W06-S1C1-03 W07-S1C1-03 W08-S1C1-03	Determine the intended audience of a writing piece.

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All lessons	W06-S1C5-01 W07-S1C5-01 W08-S1C5-01	Prepare writing in a format (e.g., oral presentation, manuscript, multimedia) appropriate for the purpose.
All lessons	W06-S1C5-04 W07-S1C5-04 W08-S1C5-04	Write legibly.
All lessons	W06-S2C1-01 W07-S2C1-01 W08-S2C1-01	Use clear, focused ideas and details to support the topic.
All lessons	W06-S2C1-02 W07-S2C1-02 W08-S2C1-02	Provide content and selected details that are well suited to audience and purpose.
All lessons	W06-S2C1-03 W07-S2C1-03 W08-S2C1-03	Develop a sufficient explanation or exploration of the topic.
All lessons	W06-S2C1-05 W07-S2C1-05 W08-S2C1-05	Include ideas and details that show original perspective.
All lessons	W06-S2C2-01 W07-S2C2-01 W08-S2C2-01	Use a structure that fits the type of writing (e.g., letter format, narrative, play, essay).
All lessons	W06-S2C3-01 W07-S2C3-01 W08-S2C3-01	Show awareness of the audience through word choice, style (6) and an appropriate connection with, or distance from, the audience. (7 & 8)
All lessons	W06-S2C3-03 W07-S2C3-03 W08-S2C3-03	Use language appropriate for the topic and purpose.
All lessons	W06-S2C3-04 W07-S2C3-04 W08-S2C3-04	Choose appropriate voice (e.g., formal, informal [6], academic discourse [7 & 8]) for the audience and purpose.
All lessons	W06-S2C6-07 W07-S2C6-07 W08-S2C6-07	Spell high frequency words correctly.
All lessons	W06-S3C2-01 W07-S3C2-01 W08-S3C2-01	Record information (e.g., observations, notes lists, charts, map labels and legends) related to the topic.

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All lessons	W06-S3C2-02 W07-S3C2-02 W08-S3C2-02	Write a summary based on the information gathered that include(s): a topic sentence, supporting details, and relevant information.
All lessons	W06-S3C3-01 W07-S3C3-01 W08-S3C3-01	Write a variety of functional texts (e.g., directions, recipes, procedures, rubrics, labels, posters, graphs/tables).
3, 4	W06-S3C6-02 W07-S3C6-02 W08-S3C6-02	Write an informational report that includes: a focused topic, appropriate facts and relevant details, a logical sequence, a concluding statement, and a list of sources used.

Arizona Comprehensive Health Education Academic Standards - Grades 6, 7, 8

Lesson	Standard	Performance Objective
4	1CH-E4-01	Illustrate how family and peers affect the choices you make regarding health.
4	1CH-E5-01	Compare healthy environments and healthy people with unhealthy environments and unhealthy people.
4	3CH-E3-01	Identify responsible and risky behaviors.